Amendments to the Claims:

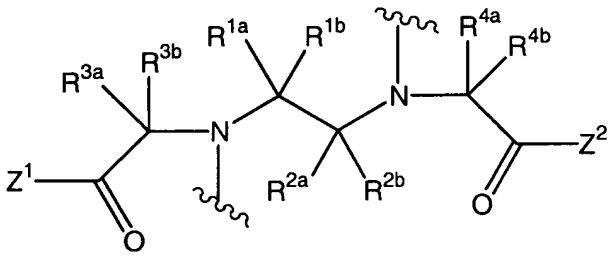
This listing of claims will replace all prior versions, and listings of claims in the application.

Listing of Claims:

1. (Original) A mutant antibody comprising a reactive site not present in the wildtype of said antibody and an antigen recognition domain that recognizes a macrocyclic metal chelate comprising four nitrogen atoms, wherein said reactive site is in a position proximate to or within said antigen recognition domain.

2. (Original) The mutant antibody of claim 1, wherein at least two of said nitrogen atoms are covalently linked to a substituted or unsubstituted ethyl bridge.

3. (Currently amended) The mutant antibody of claim 2, wherein said metal chelate comprises the subunit:



wherein

Z^1 and Z^2 are members independently selected from ~~OR~~ OR^1, O^-, and ~~NR^3R^4~~ NR^1R^2

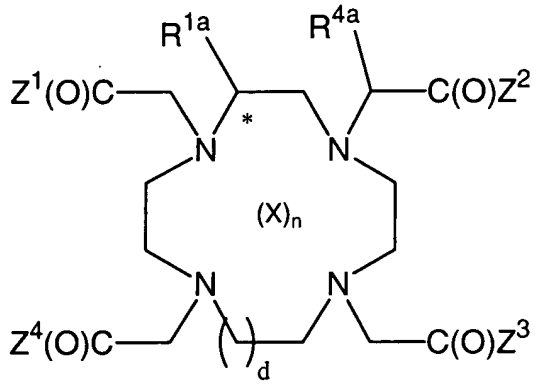
in which

~~R^3 and R^4~~ R^1 and R^2 are members independently selected from H, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl;

R^{1a}, R^{1b}, R^{2a}, R^{2b}, R^{3a}, R^{3b}, R^{4a} and R^{4b} are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl and linker moieties.

4. (Original) The mutant antibody of claim 1, wherein said chelate is a member selected from substituted or unsubstituted DOTA and substituted or unsubstituted TETA.

5. (Currently amended) The mutant antibody of claim 4, wherein said chelate has the formula:



wherein

Z^1, Z^2, Z^3 and Z^4 are members independently selected from $\underline{O^-}$, OR^1 and NR^1R^2 in which

R^1 and R^2 are members independently selected from H, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl;

X is a member selected from a lanthanide, an actinide, an alkaline earth metal, a group IIIb transition metal, or a metal;

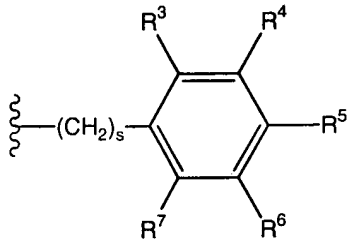
n is 0 or 1; and

d is 1 or 2.

6. (Original) The mutant antibody of claim 1, wherein said macrocyclic metal chelate comprises a reactive functional group having reactivity complementary to said reactive site of said mutant antibody.

7. (Original) The mutant antibody of claim 5, wherein the carbon atom marked * is of S configuration.

8. (Original) The mutant antibody of claim 1, comprising a moiety having the formula:



wherein

R^3, R^4, R^5, R^6 and R^7 are members independently selected from H, halogen, NO_2, CN, X^1R^8, NR^9R^{10}, and $C(X^2)R^{11}$

wherein

X^1 is a member selected from O, NH and S;

R^8 and R^9 are members independently selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl and $C(Z^3)R^{12}$

wherein

X^3 is a member selected from O, S and NH;

R^{12} is a member selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl and OR^{13}

wherein

R^{13} is a member selected from substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, substituted or unsubstituted aryl and substituted or unsubstituted heteroaryl;

R^{10} is a member selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl and OH,

and R^9 and R^{10}, taken together are optionally (=C=S);

X^2 is a member selected from O, S and NH; and

R^{11} is a member selected from H, halogen, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, OR^{14}, $NR^{15}R^{16}$

wherein

R^{14} is a member selected from H, substituted or unsubstituted alkyl, substituted or unsubstituted heteroalkyl, and $C(O)R^{17}$ wherein

R^{17} is a member selected from substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl; and

R^{15} and R^{16} are members independently selected from H, substituted or unsubstituted alkyl and substituted or unsubstituted heteroalkyl.

9. (Original) The mutant antibody according to claim 8, wherein R^{10} is -C(O)-$CHCH_2$.

10. (Original) The mutant antibody according to claim 1, wherein said reactive site is a side-chain of a naturally occurring or non-naturally occurring amino acid.

11. (Original) The mutant antibody according to claim 10, wherein said reactive site is the –SH group of cysteine.

12. (Original) The mutant antibody according to claim 10, further comprising said metal chelate bound to said antigen recognition domain, wherein said metal chelate comprises a reactive functional group of complementary reactivity to said reactive site of said antibody.

13. (Original) The mutant antibody according to claim 12, further comprising a covalent bond between reactive site of said antibody and said reactive functional group of said metal chelate.

14. (Original) The mutant antibody according to claim 1, wherein said mutant antibody is mutant of 2D12.5.

15. (Original) The mutant antibody according to claim 14, wherein asparagine-88 residue of the heavy-chain is substituted by an aspartic acid residue.

16. (Original) The mutant antibody according to claim 15, wherein glycine-54 residue of the heavy-chain is substituted by a cysteine residue.

17. (Original) The mutant antibody according to claim 15, wherein glycine-55 residue of the heavy-chain is substituted by a cysteine residue.

18. (Currently Amended) The mutant antibody according to claim 15, wherein glycine-56 residue of the heavy-chain is substituted by a cysteine residue.

19. (Original) The mutant antibody according to claim 14, wherein asparagine-54 of the light chain is substituted by a cysteine residue.

20. (Original) The mutant antibody of claim 1, further comprising a targeting moiety.

21. (Original) The mutant antibody according to claim 20, wherein said targeting moiety binds specifically to a cell surface protein.

22. (Original) The mutant antibody according to claim 20, wherein the targeting moiety is covalently attached to said mutant antibody.

23. (Original) The mutant antibody according to claim 21, wherein the targeting moiety is an antibody.

24. (Original) The mutant antibody according to claim 22, wherein the targeting moiety specifically binds to a protein on a cancer cell.

25. (Original) A composition having the structure:

$$(Ab)_{n'}\text{-}L\text{-}T$$

wherein,

n′ is an integer from 1-10;

Ab represents a mutant antibody according to claim 1;

L is a chemical bond or linking group that may contain one or more functional groups; and

T is said targeting moiety.

26. (Original) The composition of claim 25, wherein said targeting moiety is an antibody that binds specifically to a cell surface antigen.

27. (Original) A pharmaceutical composition comprising the composition of claim 25, and a pharmaceutically acceptable carrier.

28. (Original) A method of *in vivo* imaging, said method comprising the steps of :

(a) administering to said subject a mutant antibody of claim 1, wherein said antibody comprises a targeting moiety that binds specifically to a cell by binding with a member selected from the group consisting of cell surface receptors and cell surface antigens, thereby forming a cell-mutant antibody complex; and

(b) administering to said subject said metal chelate, thereby specifically binding said compound to said mutant antibody to form a cell-antibody-metal chelate complex; and

(c) detecting said cell-mutant antibody-metal chelate complex.

29. (Original) The method of claim 28, wherein the step of detecting is by positron emission tomography.

30. (Original) The method of claim 28, wherein the step of detecting is by magnetic resonance imaging.

31. (Original) The method of claim 28, wherein the step of detecting is by detection of lanthanide luminescence.

32. (Original) The method of claim 28, further comprising, between steps (a) and (b), administering a clearing agent to said subject.

33. (Original) The method of claim 28, wherein the subject is a mammal.

34. (Original) The method of claim 33, wherein the mammal is a human.

35 . (Original) A method of treating a subject with cancer by administration of a metal chelate, said method comprising the steps of :

(a) administering to said subject a mutant antibody of claim 1, wherein said antibody comprises a targeting moiety that binds specifically to a cell by binding with a member

selected from the group consisting of cell surface receptors and cell surface antigens, thereby forming a cell-mutant antibody complex; and

(b) administering to said subject said metal chelate, thereby specifically binding said compound to mutant antibody to form a cell-mutant antibody-metal chelate complex.

36. (Original) The method of claim 35, wherein the subject is a mammal.

37. (Original) The method of claim 36, wherein the mammal is a human.

38. (Original) An isolated nucleic acid, comprising a sequence selected from a sequence as set forth in SEQ ID NOS:16, 17, 18, 19, 20, 25, 26, 31, 32, 42, 43, 44, 45, 46, and 47.

39. (Original) A polypeptide comprising an amino acid sequence selected from a sequence as set forth in SEQ ID NOS: 10, 11, 12, 13, 14, 22, 23, 27, 28, 35, 36, 37, 38, 39, and 40.

40. (Original) The isolated nucleic acid according to claim 38, further comprising a promoter operably linked to the nucleic acid sequence.

41. (Original) An expression vector comprising the nucleic acid according to claim 40.

42. (Original) A host cell comprising the expression vector according to claim 41.